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| 09/823,372   | 03/30/2001  | John E. Dolan        | KLR 7146.109        | 7358             |
| 47915  | 7590        | 03/17/2006           | EXAMINER            |                  |
| CHERNOFF, VILHAUER, MCCLUNG & STENZEL, LLP<br>1600 ODS TOWER<br>601 SW SECOND AVENUE<br>PORTLAND, OR 97204 |             |                      | THOMPSON, JAMES A   |                  |
|  |             |                      | ART UNIT            | PAPER NUMBER     |
|  |             |                      | 2624                |                  |

DATE MAILED: 03/17/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/823,372

Applicant(s)

DOLAN ET AL.

Examiner

James A. Thompson

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 30 December 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 2-15, 17, 18, 20-28, 34 and 40 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 2-15, 17, 18, 20-28, 34 and 40 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 March 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 30 December 2005 has been entered.

### ***Response to Arguments***

2. Applicant's arguments filed 30 December 2005 have been fully considered but they are not persuasive. While Examiner agrees with Applicant that the present amendments to the claims overcomes the previously cited prior art references, additional prior art has been discovered which renders the present amendments to the claims obvious to one of ordinary skill in the art at the time of the invention.

### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 2-8 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 2 recites the limitation "said object" in line 1. There is insufficient antecedent basis for this limitation in the claim. Claim 7 recites the limitation "said imaging device" in line 1. There is insufficient antecedent basis for this limitation in the claim.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 2-3, 12, 14-15, 17-18, 20-21, 24-25, 28, 34 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ichihara (US Patent 5,198,853) in view of Feng (US Patent 6,046,828).

**Regarding claim 40:** Ichihara discloses an imaging system (figures 1-4 and column 4, lines 45-55 of Ichihara) comprising an image sensor (figure 1(4) and column 5, lines 58-63 of Ichihara); a backing (figure 2(2) of Ichihara) having a surface opposed to said sensor (as clearly shown in figure 2 and column 5, lines 49-53 of Ichihara); and an image processor (figure 4(35) and column 7, lines 44-48 of Ichihara) having a plurality of stat buffers (figure 4(23a,28,30,33,34); and column 7, lines 6-9 and lines 44-48 of Ichihara) and that analyzes candidate edges for bounding regions (figure 3B and column 6, lines 56-61 of Ichihara) and identifies edges cast by a shadow on said

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backing as edges of a bounding region (column 17, lines 56-61 of Ichihara) based, at least in part, on a variable luminance threshold value (column 7, lines 48-51 and column 9, lines 11-18 of Ichihara) compared with a set of statistical measures (figure 6-A; figure 6-B; and column 7, lines 58-64 of Ichihara) and that causes detection of candidate edges cast by a shadow on said backing (column 7, lines 64-68 of Ichihara); and the presence of candidate edges in a contiguous plurality of stat buffers (figure 7(F-6 to F-12); figure 8(P-5 to P-8); and column 9, lines 48-62 of Ichihara).

Ichihara does not disclose expressly that said variable luminance threshold is calculated using said set of statistical measures.

Feng discloses calculating a variable luminance threshold using a set of statistical measures (figure 3-6; column 5, lines 19-28; and column 6, lines 48-57 of Feng).

Ichihara and Feng are combinable because they are from the same field of endeavor, namely the detection of document edges in a document image scanning system. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use the set of statistical measures taught by Ichihara to set the variable luminance threshold, as taught by Feng. The suggestion for doing so would have been that the measurements for determining the edges of a scanned document are statistical in nature (column 7, lines 58-64 of Ichihara; and column 5, lines 19-18 of Feng). A further suggestion for doing so would have been that the determination of boundary edges is based on the relative values of the threshold and the statistical calculations derived from edge candidate pixels (figure 7(F-6,F-10); figure 8(P-5); and column 9, lines 11-18 of

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Ichihara). Therefore, it would have been obvious to combine Feng with Ichihara to obtain the invention as specified in claim 40.

**Regarding claim 2:** Ichihara discloses that the scanned object is essentially flat (figure 2(G) and column 6, lines 33-40 of Ichihara). The document to be scanned (figure 2(G) and column 6, lines 33-40 of Ichihara) is clearly flat.

**Regarding claim 3:** Ichihara discloses that said backing is a cover (column 5, lines 49-53 of Ichihara) and is substantially flat (as can clearly be seen in figure 2 of Ichihara) and is in a face-to-face relationship with said object (figure 2 and column 6, lines 37-40 of Ichihara).

**Regarding claim 12:** Ichihara discloses that said imaging system increases the difference (variation ratio) of luminance values in the range of likely document edge values (column 8, lines 58-68 of Ichihara).

**Regarding claim 14:** Ichihara discloses that an image obtained from sensing said object has a plurality of horizontal rows of pixels vertically aligned with respect to each other (figure 5 and column 8, lines 19-23 of Ichihara), and said imaging system groups said horizontal rows of pixels into a plurality of vertically contiguous groups (column 8, lines 62-67 of Ichihara), and said imaging system computes a statistical measure in a direction transverse to said horizontal row of pixels (column 8, line 67 to column 9, line 5 of Ichihara), using said statistical measure when detecting said boundary region (figure 6-A; figure 7; and column 7, lines 58-68 of Ichihara).

**Regarding claim 15:** Ichihara discloses that an image obtained from sensing said object has a plurality of vertical

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columns of pixels horizontally aligned with respect to each other (figure 5 and column 8, lines 24-28 of Ichihara), and said imaging system groups said vertical columns of pixels into a plurality of horizontally contiguous groups (column 9, lines 41-49 of Ichihara), and said imaging system computes a statistical measure in a direction transverse to said vertical column of pixels (column 9, lines 46-54 of Ichihara), using said statistical measure when detecting said boundary region (figure 6-B; figure 8; and column 9, lines 53-62 of Ichihara).

**Regarding claims 17 and 18:** Ichihara discloses that said imaging system detects edges using said statistical measure (column 7, lines 64-68 and column 8, lines 10-14 of Ichihara).

**Regarding claim 20:** Ichihara discloses that a set of statistical measures in a direction transverse to said horizontal row of pixels from a plurality of said groups are statistically processed for detecting said boundary region (figure 6-A and column 7, lines 59-68 of Ichihara).

**Regarding claim 21:** Ichihara discloses that a set of statistical measure in a direction transverse to said vertical column of pixels from a plurality of said groups are statistically processed for detected a said boundary region (figure 6-B and column 8, lines 1-14 of Ichihara).

**Further regarding claim 24:** Feng discloses that said threshold value varies with the size of the object being images (column 6, lines 52-56 of Feng).

**Regarding claim 25:** Ichihara discloses that said imaging system determines said at least one boundary of said object based upon a variable (column 10, lines 63-68 of Ichihara) said threshold value (column 9, lines 11-18 and lines 48-53 of Ichihara).

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Ichihara does not disclose expressly that said threshold value is calculated using said set of statistical measures.

Feng discloses calculating a variable luminance threshold using a set of statistical measures (figure 3-6; column 5, lines 19-28; and column 6, lines 48-57 of Feng).

Ichihara and Feng are combinable because they are from the same field of endeavor, namely the detection of document edges in a document image scanning system. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use the set of statistical measures taught by Ichihara to set the variable luminance threshold, as taught by Feng. The suggestion for doing so would have been that the measurements for determining the edges of a scanned document are statistical in nature (column 7, lines 58-64 of Ichihara; and column 5, lines 19-18 of Feng). A further suggestion for doing so would have been that the determination of boundary edges is based on the relative values of the threshold and the statistical calculations derived from edge candidate pixels (figure 7(F-6,F-10); figure 8(P-5); and column 9, lines 11-18 of Ichihara). Therefore, it would have been obvious to combine Feng with Ichihara to obtain the invention as specified in claim 25.

**Regarding claim 28:** Ichihara discloses that an image obtained from sensing said object has a plurality of horizontal rows of pixels (figure 5 and column 8, lines 19-23 of Ichihara).

**Regarding claim 34:** Ichihara discloses that an image obtained from sensing said object has a plurality of vertical columns of pixels (figure 5 and column 8, lines 24-28 of Ichihara).



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7. Claims 4-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ichihara (US Patent 5,198,853) in view of Feng (US Patent 6,046,828) and Yamanishi (US Patent 5,696,595).

**Regarding claim 4:** Ichihara discloses that the edges of a document are determined based on the shadows cast on the cover (figure 2(2) and column 17, lines 56-61 of Ichihara) and that soil and toner, which would cause inconsistencies in the coloration of the cover, worsens the detectability of document edges (column 10, lines 44-50 of Ichihara). Thus, it would be reasonable to infer that said cover has a background color that covers a major portion of said cover. However, Ichihara in view of Feng does not expressly disclose said cover has a background color that covers a major portion of said cover.

Yamanishi discloses a background color (white) that covers a major portion of a scanner cover (column 10, lines 53-55 of Yamanishi). Since the scanner cover is white (column 10, lines 53-55 of Yamanishi), then clearly the background color (white) covers a major portion of said scanner cover.

Ichihara in view of Feng is combinable with Yamanishi because they are from the same field of endeavor, namely scanning and processing digital image and document data. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to specifically use a cover which has a background color that covers a major portion of said cover, as taught by Yamanishi. The suggestion for doing so would have been that inconsistencies in the coloration of the cover worsens the detectability of document edges (column 10, lines 44-50 of Ichihara). Thus, one of ordinary skill in the art at the time of the invention would naturally use a background color for the cover that covers a major portion of said cover. Therefore, it

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would have been obvious to combine Yamanishi with Ichihara in view of Feng to obtain the invention as specified in claim 4.

**Regarding claim 5:** Ichihara discloses that said imaging system is capable of determining a plurality of boundaries of said object (figure 5; column 7, lines 64-68; and column 8, lines 7-14 of Ichihara).

**Regarding claim 6:** Ichihara discloses that said imaging system is capable of determining four boundaries of said object (figure 5; column 7, lines 64-68; and column 8, lines 7-14 of Ichihara).

**Regarding claim 7:** Ichihara discloses that said imaging system has a flat surface supporting said object (figure 2(1) and column 5, lines 49-51 of Ichihara).

**Regarding claim 8:** Ichihara discloses that said object is paper (figure 2(G); figure 3-B(A3,A4,B5); and column 5, lines 49-51 of Ichihara). The object (figure 2(G) of Ichihara) that is scanned is a document (column 5, lines 49-51 of Ichihara). Furthermore, the scanner is clearly set for scanning standard paper sizes (figure 3-B(A3,A4,B5) of Ichihara). Therefore, said object is clearly paper.

8. Claims 9-11, 13, 22-23 and 26-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ichihara (US Patent 5,198,853) in view of Feng (US Patent 6,046,828) and Kowalski (US Patent 5,778,104).

**Regarding claims 9 and 13:** Ichihara in view of Feng does not disclose expressly that said imaging system converts a first color space of an image obtained from sensing said object to a second color space where the luminance of said image is enhanced over the first color space.

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Kowalski discloses converting a first color space of an image obtained from sensing said object (column 3, lines 53-59 of Kowalski) to a second color space (column 3, lines 66-67 of Kowalski), where the luminance of said image is enhanced over the first color space (column 4, lines 2-11 of Kowalski). Computing the luminance values by using different coefficients, and therefore different proportions, of the color components (column 4, lines 2-11 of Kowalski) enhances the luminance values of the first color space.

Ichihara in view of Feng is combinable with Kowalski because they are from the same field of endeavor, namely digital image data scanning and processing. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to convert a color document into enhanced luminance values, as taught by Kowalski, in order to detect the boundaries using the imaging system taught by Ichihara. The suggestion for doing so would have been that the imaging system of Ichihara operates based on the difference in luminance values of the image, which are used to detect the shadows (column 8, lines 58-68 of Ichihara). Therefore, if a color image is to be processed, the color component values need to be converted into luminance values for processing. Therefore, it would have been obvious to combine Kowalski with Ichihara in view of Feng to obtain the invention as specified in claims 9 and 13.

**Further regarding claim 10:** Kowalski discloses that said first color space includes a plurality of dimensions (column 3, lines 46-51 of Kowalski) and said second color space includes fewer dimensions than said first color space (column 4, lines 4-11 of Kowalski). There are three color components, such as RGB, in said first color space (column 3, lines 46-51 of Kowalski)

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and only one color component (luminance) in said second color space (column 4, lines 4-11 of Kowalski).

**Further regarding claim 11:** Kowalski discloses that said first color space is red, green and blue (column 3, lines 51-52 of Kowalski), and said second color space is luminance (column 4, lines 4-11 of Kowalski).

**Regarding claims 22 and 23:** Ichihara in view of Feng does not disclose expressly that the statistical processing said set of statistical measures emphasizes spatial regions of increased statistical measure.

Kowalski discloses further processing spatial regions of increased statistical measure to emphasize said regions (column 4, lines 37-39 and lines 56-61 of Kowalski). Filter values are determined for a neighborhood of pixels (column 4, lines 37-39 of Kowalski) based on the statistical measure of said neighborhood (column 4, lines 56-61 of Kowalski).

Ichihara in view of Feng is combinable with Kowalski because they are from the same field of endeavor, namely digital image data scanning and processing. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to filter the image data based on the variation between the minimum and maximum luminance values of a group, as taught by Kowalski. Therefore, in the system taught by Ichihara in view of Feng, the variation of the luminance values would determine how much emphasis a group would receive, depending on whether or not there is an edge. The motivation for doing so would have been to improve the quality of an image which comprise a combination of features (column 3, lines 2-7 of Kowalski). Therefore, it would have been obvious to combine

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Kowalski with Ichihara in view of Feng to obtain the invention as specified in claims 22 and 23.

**Regarding claims 26 and 27:** Ichihara in view of Feng does not disclose expressly that said variable threshold value is calculated based upon a percentage of the maximum observed statistical measure.

Kowalski discloses calculating the variable filter values of the neighborhood of pixels based upon a percentage of the maximum observed statistical measure (column 4, lines 56-61 of Kowalski). The percentage difference between the maximum and minimum luminance values of the neighborhood of pixels determines the filter value since  $L_{min}$  changes linearly from  $1/9$  to 1 as said difference increases (column 4, lines 56-61 of Kowalski). In other words, as percentage difference between  $L_{min}$  and  $L_{max}$  increases, the variable filter values increase.

Ichihara in view of Feng is combinable with Kowalski because they are from the same field of endeavor, namely digital image data scanning and processing. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to set the variable threshold taught by Ichihara in view of Feng based on the percentage of the statistical measures, as taught by Kowalski. The motivation for doing so would have been to improve the quality of an image which comprise a combination of features (column 3, lines 2-7 of Kowalski), and would therefore require a variable threshold. Therefore, it would have been obvious to combine Kowalski with Ichihara in view of Feng to obtain the invention as specified in claims 26 and 27.

**Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James A. Thompson whose telephone number is 571-272-7441. The examiner can normally be reached on 8:30AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David K. Moore can be reached on 571-272-7437. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



10 March 2006

James A. Thompson  
Examiner  
Division 2625



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